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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SHENG, TOM V

ART UNIT	PAPER NUMBER
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2629

MAIL DATE	DELIVERY MODE
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11/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/506,290	Applicant(s) HOPPENBROUWERS ET AL.	
	Examiner Tom V. Sheng	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-11,14-19 and 21 is/are rejected.
- 7) ☒ Claim(s) 2,3,12,13 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 7-11, 17-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (US 2001/0005188 A1).

As for claim 1 and associated claims 10 and 11, Watanabe teaches a flat panel display apparatus (fig. 1) comprising:

plasma discharge cells (plasma display panel 14 inherently has discharge cells as pixels) that include sustain electrodes (sustain electrodes X; fig. 1) and scan electrodes (scan electrodes Y1-Yn; fig. 1); and

a drive circuit (data electrode drive circuit 9) for providing data arranged in subfields to the discharge cells (sub-field driving is inherent in PDP), which includes an energy recovery circuit (charge recovery circuit 12).

Watanabe teaches an image signal accumulator 16 for accumulating the intensity of each pixel for each frame/field of an image signal and a comparator 17 for determining when the accumulated value is larger or smaller than a prescribed value. When the accumulated value is lower than the prescribed value, the charge recovery circuit 12, controlled by a charge recovery controller 4, would perform a relatively short

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recovery. On the other hand, when the accumulated value is higher than the prescribed value, a relatively longer recovery would be performed. See paragraphs 33-36.

Watanabe does not expressly teach means for activating the energy recovery circuit only for a part of the total number of subfields.

However, Watanabe teaches that alternatively, charge recovery period can be controlled for only a sub-field having an intensity weight that is relatively large, and not be controlled for a sub-field having a relatively small intensity weight. See paragraph 38.

One of ordinary skill in the art would recognize that since a sub-field having a small intensity weight accordingly has a low charge requirement, charge recovery could actually be not used with only a minor impact on power consumption. Moreover display timing is improved when clamping to GND or -VS is implemented directly without the recovery step.

Therefore, it would have been obvious to have no charge recovery during those small intensity weight sub-fields of Watanabe, as the use of charge recovery is not justified, to optimize the charge recovery of those small intensity weights sub-fields (paragraph 44).

As for claims 7-8 and 17-19, the accumulated value comparator 17 with the charge recovery timing controller 4 correspond to claimed discriminator depending on subfield load, since the comparator and controller combination controls the recovery time or even disable recovery based on the intensity weight of the subfield.

As for claims 9 and 21, Watanabe as modified would have certain subfield(s) with small intensity weight having no charge recovery at all, thus corresponding to claimed select subfields being predetermined or fixed.

3. Claims 4-6 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe as applied to claims 1 and 11 above, and further in view of Salavin et al. (US 6,124,676; hereinafter Salavin).

As for claims 4 and 14, Watanabe teaches scan electrodes Y1-Yn, sustain/common electrodes X and data electrodes D1-Dk all being straight, as shown in fig. 1. However, Watanabe does not teach that the data electrodes (also known as address electrodes in PDP) are positioned in a zigzag configuration.

Salavin teaches a plasma display panel (fig. 2a). Specifically, each row electrode (Y1, Y2 ...) is in the form of a zigzag in order to pass the color recesses Ep1, Ep2, Ep3 of each pixel P (column 1 line 66 through column 2 line 9 and column 6 lines 19-27). One of ordinary skill in the art recognizes that this distribution of recesses (i.e. color subpixels) and the use of a zigzag electrode are advantageous in improving light efficiency without degrading its contrast (fig. 2a; column 5 lines 1-21). Moreover, use of a zigzag electrode naturally eliminates the need of two parallel run sub-electrodes. Finally, even though it is the row/scan electrode being in a zigzag manner, it could alternatively be done with the data/address electrode being the one formed in a zigzag manner, since both ways are functionally equivalent with no one way being harder to implement than the other way.

Therefore, it would have been obvious to incorporate the teaching of Salavin in a modified manner such that the data/address electrodes are positioned in a zigzag manner passing through respective color subpixels, due to the advantageous in improving light efficiency without degrading contrast.

As for claims 5 and 15, as modified by Salavin, each data/address electrode is alternately coupled in subsequent rows to a cell (i.e. subpixel/recess) of a pixel in a first column and to a cell of a pixel (same pixel) in a column adjacent to the first column. That is, as modified, the cells/subpixels are alternately distributed between two columns and are accessed by a common address/data electrode formed in a zigzag manner.

As for claims 6 and 16, since claims 1, 5 and 6 do not recite the claimed invention as for color display, it is understood that in a monochromatic display, the zigzag coupled cells would be for grayscale display only and thus of the same "color".

Allowable Subject Matter

4. Claims 2, 3, 12, 13 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record teaches the limitations, "wherein the part of the number of subfields has on average a lower weight than the rest of the sub-fields" of claim 2, "the select subfields have, on average, a lower weight than a remainder of the subfields of the total number of subfields" of claim 12, and "wherein the discriminator is

configured to select the select subfield based on a variance of the display data at the select subfield" of claim 20. Claims 3 and 13 are dependent on claims 2 and 12, respectively.

Response to Arguments

6. Applicant's arguments filed on 9/4/2007 have been fully considered but they are not persuasive. The applicant argues that "Watanabe merely teaches that the modification/control of the period of charge recovery is not performed for sub-fields having low intensity weight, and does not teach the elimination of the charge recovery period for these sub-fields." The examiner respectfully disagrees. First the rejection is an obviousness type USC 103 rejection. Second the cited passages above clearly state T as the charge recovery period (fig. 3). Clearly, the smaller the subfield weight, the more impact is the recovery time T (controlled by switches S1 and S2, paragraph 45) on the subfield time. As such, there is a definite advantage in eliminating the recovery time T (i.e. $T=0$) with at least the smallest subfield.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V. Sheng whose telephone number is (571) 272-7684. The examiner can normally be reached on 9:00am - 6:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tom Sheng

AMR A. AWAD
SUPERVISORY PATENT EXAMINER
